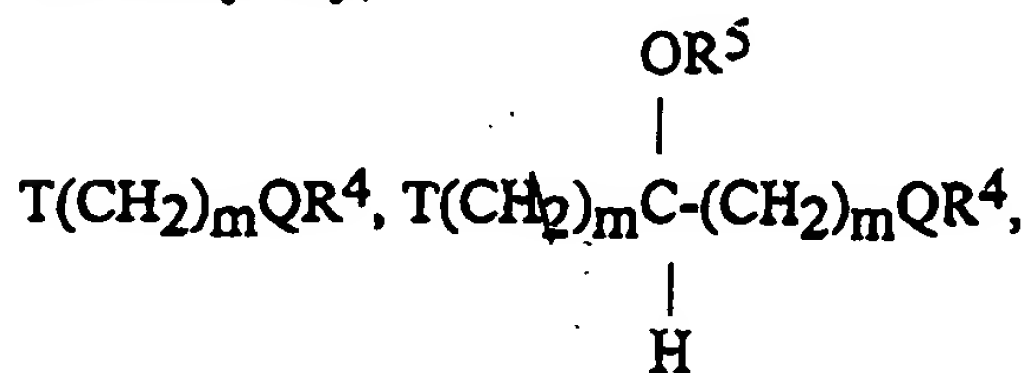


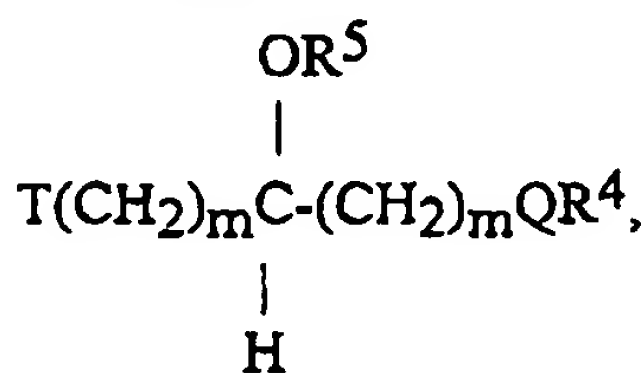
cycloalkyl, C₂-C₁₀ alkenyl, and C₂-C₁₀ alkynyl, wherein n is 0, 1, 2, or 3, and the (CH₂)_nAr, (CH₂)_nheteroaryl, alkyl, cycloalkyl, alkenyl, and alkynyl groups are optionally substituted by up to 5 groups selected from NR⁴R⁵, N⁺(O)R⁴R⁵, N⁺R⁴R⁵R⁶Y⁻, alkyl, phenyl, substituted phenyl, (CH₂)_nheteroaryl, hydroxy, alkoxy, phenoxy, thiol, thioalkyl, halo, COR⁴, CO₂R⁴, CONR⁴R⁵, SO₂NR⁴R⁵, SO₃R⁴, PO₃R⁴, aldehyde, nitrile, nitro, heteroaryloxy,



C(O)T(CH₂)_mQR⁴, NHC(O)T(CH₂)_mQR⁴, T(CH₂)_mC(O)NR⁴NR⁵, or T(CH₂)_mCO₂R⁴ wherein each m is independently 1-6, T is O, S, NR⁴, N⁺(O)R⁴, N⁺R⁴R⁶Y⁻, or QR⁴R⁵, and Q is O, S, NR⁵, N⁺(O)R⁵ or N⁺R⁵R⁶Y⁻;

and additionally alkyl, alkenyl and alkynyl can be further substituted with one to three cycloalkyl groups,

when the dotted line is present, R³ is absent; otherwise R³ has the meanings of R², wherein R² is as defined above, as well as OH, NR⁴R⁵, COOR⁴, OR⁴, CONR⁴R⁵, SO₂NR⁴R⁵, SO₃R⁴, PO₃R⁴, T(CH₂)_mQR⁴,



wherein T and Q are as defined above;

R⁴ and R⁵ are each independently selected from the group consisting of hydrogen, C₁-C₆ alkyl, substituted alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, N(C₁-C₆alkyl)₁ or 2, (CH₂)_nAr, C₃-C₁₀ cycloalkyl, heterocyclyl, and heteroaryl, or R⁴ and R⁵ together with the nitrogen to which they are attached optionally form a ring having 3 to 7 carbon atoms and said ring optionally contains 1, 2, or 3 heteroatoms selected from the group consisting of nitrogen, substituted nitrogen, oxygen, and sulfur;

when R⁴ and R⁵ together with the nitrogen to which they are attached form a ring, the said ring is optionally substituted by 1 to 3 groups selected from OH,

OR^4 , NR^4R^5 , $(CH_2)_mOR^4$, $(CH_2)_mNR^4R^5$, $T-(CH_2)_mQR^4$,
 $CO-T-(CH_2)_mQR^4$, $NH(CO)T(CH_2)_mQR^4$, $T-(CH_2)_mCO_2R^4$, or
 $T(CH_2)_mCONR^4R^5$;

R^6 is alkyl;

R^8 and R^9 independently are H, NR^4R^5 , $N^+(O)R^4R^5$, $N^+R^4R^5R^6Y^-$, COR^4 ,
 CO_2R^4 , $CONR^4R^5$, $SO_2NR^4R^5$, SO_3R^4 , PO_3R^4 , CN or nitro;

when the dotted line is absent, R^9 can additionally
be = NOH,

= NOalkyl, = NOalkenyl, = NOalkynyl or = NOcycloalkyl;

and

Y is a halo counter-ion;

with the proviso that: (a) when R^8 and R^9 are both hydrogen, W is NH, R^1 is hydrogen
and X is NR^{10} , then R^{10} is neither unsubstituted (C_1 - C_{10}) alkyl, unsubstituted (C_1 - C_{10})
alkenyl nor unsubstituted (C_1 - C_{10}) alkynyl;

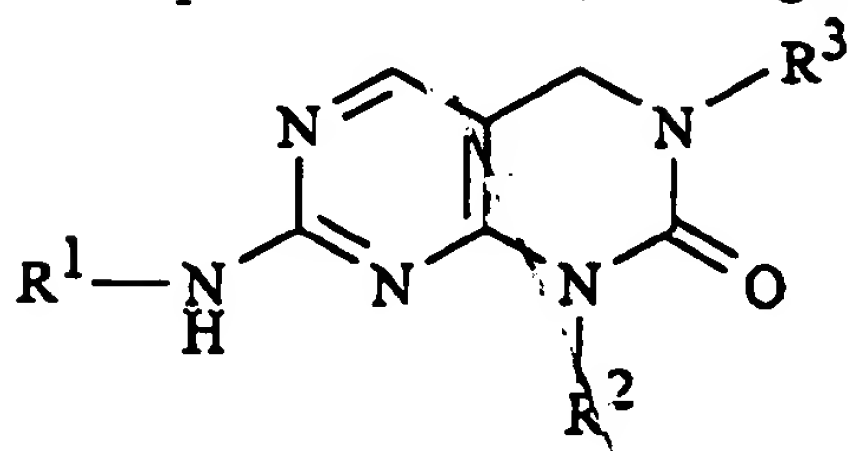
(b) when R^8 or R^9 is NR^4R^5 , $N^+(O)R^4R^5$, or $N^+R^4R^5R^6Y^-$, then one or more of R^4 , R^5 and
 R^6 must be, independent of the nitrogen to which said one or more R^4 , R^5 and R^6 are
attached, heterocyclic or heteroaryl; and

(c) when R^8 or R^9 is COR^4 , CO_2R^4 , $CONR^4R^5$, $SO_2NR^4R^5$, SO_3R^4 or PO_3R^4 , then one or
more of R^4 , R^5 and R^6 must be, independent of the nitrogen to which said one or more R^4 ,
 R^5 and R^6 are attached, $(CH_2)_n$ aryl wherein n is zero, 1, 2 or 3, heterocyclic or heteroaryl;

(d) when X is S and W is NH, then at least one of R^1 , R^2 , R^3 , R^8 and R^9 is other than H
or C_1 - C_3 alkyl

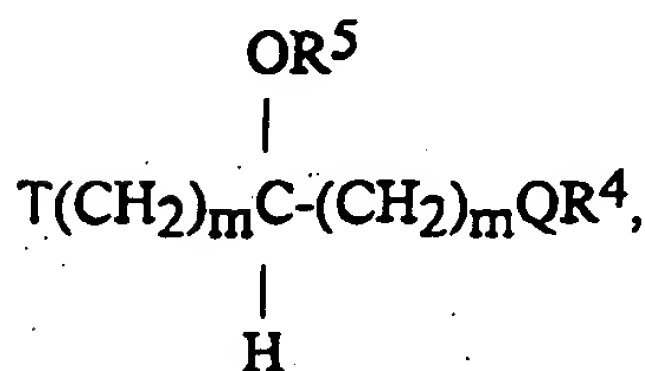
55. A compound of Claim 54, wherein W is NH, and R^8 and R^9 both are hydrogen.

56. A compound of Claim 55 having the formula



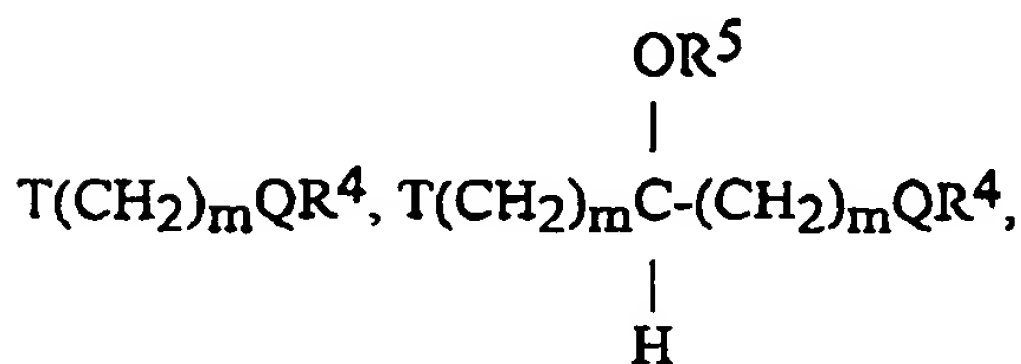
wherein:

R¹ and R² independently are hydrogen, C₁-C₁₀ alkyl, (CH₂)_nAr, (CH₂)_nheteroaryl, C₃-C₁₀ cycloalkyl, or (CH₂)_n heterocyclyl, wherein n is 0, 1, 2 or 3, and the (CH₂)_nAr, (CH₂)_nheteroaryl, alkyl, cycloalkyl and (CH₂)_n heterocyclyl groups are optionally substituted by up to 5 groups selected from NR⁴R⁵, N⁺(O)R⁴R⁵, N⁺R⁴R⁵R⁶Y⁻, alkyl, phenyl, substituted phenyl, (CH₂)_nheteroaryl, hydroxy, alkoxy, phenoxy, thiol, thioalkyl, halo, COR⁴, CO₂R⁴, CONR⁴R⁵, SO₂NR⁴R⁵, SO₃R⁴, PO₃R⁴, aldehyde, nitrile, nitro, heteroaryloxy, T(CH₂)_mQR⁴,



NHC(O)T(CH₂)_mQR⁴, T(CH₂)_mC(O)NR⁴NR⁵, or T(CH₂)_mCO₂R⁴ wherein each m is independently 1-6, T is O, S, NR⁴, N⁺(O)R⁴, N⁺R⁴R⁶Y⁻, or CR⁴R⁵, and Q is O, S, NR⁵, N⁺(O)R⁵, or N⁺R⁵R⁶Y⁻;

R³ has the meanings of R², wherein R² is as defined above, as well as OH, NR⁴R⁵, COOR⁴, OR⁴, CONR⁴R⁵, SO₂NR⁴R⁵, SO₃R⁴, PO₃R⁴,



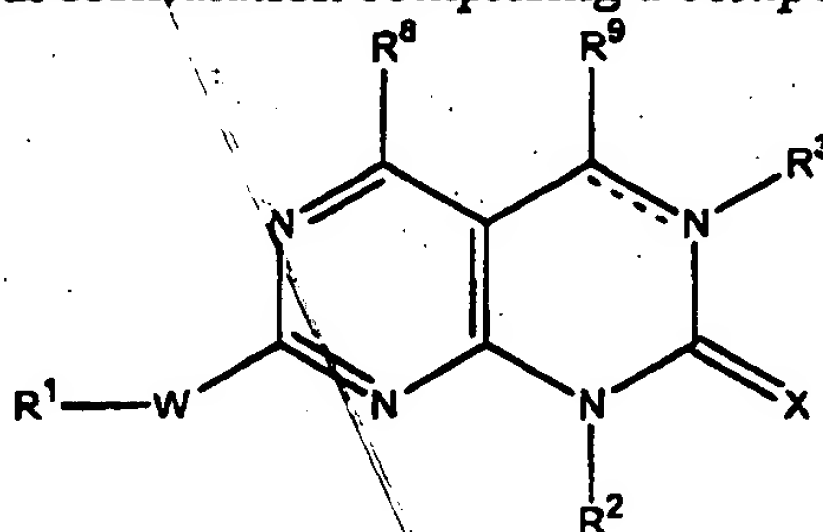
wherein T and Q are as defined above;

R^4 and R^5 are each independently selected from the group consisting of hydrogen, C_1 - C_6 alkyl, substituted alkyl, C_2 - C_6 alkenyl, C_2 - C_6 alkynyl, $N(C_1$ - C_6 alkyl) $_1$ or $_2$, $(CH_2)_n$ Ar, C_3 - C_{10} cycloalkyl, heterocyclyl, and heteroaryl, or R^4 and R^5 together with the nitrogen to which they are attached optionally form a ring having 3 to 7 carbon atoms and said ring optionally contains 1, 2, or 3 heteroatoms selected from the group consisting of nitrogen, substituted nitrogen, oxygen, and sulfur; when R^4 and R^5 together with the nitrogen to which they are attached form a ring, the said ring is optionally substituted by 1 to 3 groups selected from OH, OR^4 , NR^4R^5 , $(CH_2)_mOR^4$, $(CH_2)_mNR^4R^5$, $T-(CH_2)_mQR^4$, $CO-T-(CH_2)_mQR^4$, $NH(CO)T(CH_2)_mQR^4$, $T-(CH_2)_mCO_2R^4$, or $T(CH_2)_mCONR^4R^5$; R^6 is alkyl; and

Y is a halo counter-ion.

57. A compound of Claim 54 wherein W is S, SO, or SO_2 .

58. A pharmaceutical formulation comprising a compound of compound of Formula I



or a pharmaceutically acceptable salt thereof, wherein:

the dotted line represents an optional double bond;

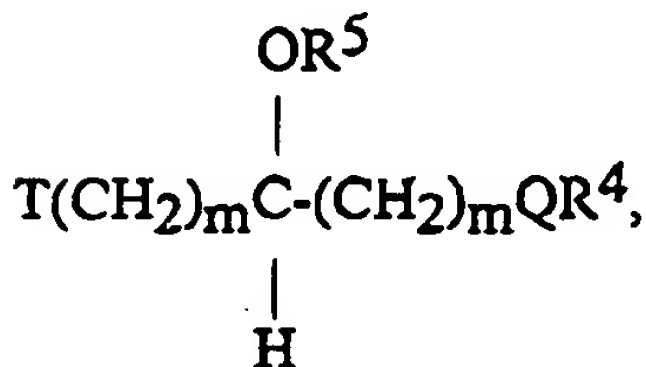
W is NH, S, SO, or SO_2 ;

X is either O, S, or NR^{10} ;

R^1 , R^2 , and R^{10} are independently selected from the group consisting of H, $(CH_2)_n$ Ar, COR^4 , $(CH_2)_n$ heteroaryl, $(CH_2)_n$ heterocyclyl, C_1 - C_{10} alkyl, C_3 - C_{10} cycloalkyl, C_2 - C_{10} alkenyl, and C_2 - C_{10} alkynyl, wherein n is 0, 1, 2, or 3, and the $(CH_2)_n$ Ar, $(CH_2)_n$ heteroaryl, alkyl, cycloalkyl, alkenyl, and alkynyl groups are optionally substituted by up to 5 groups selected from NR^4R^5 , $N^+(O)R^4R^5$, $N^+R^4R^5R^6Y^-$, alkyl, phenyl, substituted phenyl, $(CH_2)_n$ heteroaryl, hydroxy,

alkoxy, phenoxy, thiol, thioalkyl, halo, COR⁴, CO₂R⁴, CONR⁴R⁵, SO₂NR⁴R⁵, SO₃R⁴, PO₃R⁴, aldehyde, nitrile, nitro,

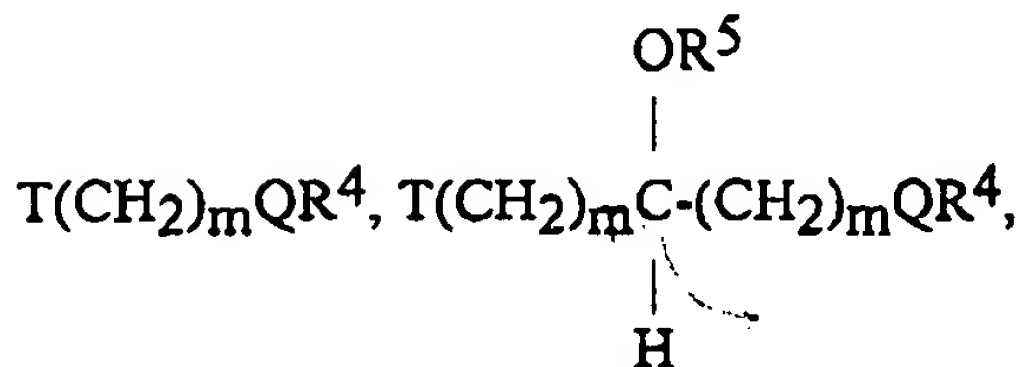
heteroaryloxy,
T(CH₂)_mQR⁴,



C(O)T(CH₂)_mQR⁴, NHC(O)T(CH₂)_mQR⁴, T(CH₂)_mC(O)NR⁴NR⁵, or T(CH₂)_mCO₂R⁴ wherein each m is independently 1-6, T is O, S, NR⁴, N⁺(O)R⁴, N⁺R⁴R⁶Y⁻, or CR⁴R⁵, and Q is O, S, NR⁵, N⁺(O)R⁵ or N⁺R⁵R⁶Y⁻;

and additionally alkyl, alkenyl and alkynyl can be further substituted with one to three cycloalkyl groups,

when the dotted line is present, R³ is absent;
otherwise R³ has the meanings of R², wherein R² is as defined above, as well as OH, NR⁴R⁵, COOR⁴, OR⁴, CONR⁴R⁵, SO₂NR⁴R⁵, SO₃R⁴, PO₃R⁴,



wherein T and Q are as defined above;
R⁴ and R⁵ are each independently selected from the group consisting of hydrogen, C₁-C₆ alkyl, substituted alkyl, C₂-C₆ alkenyl, C₂-C₆ alkynyl, N(C₁-C₆alkyl)₁ or 2, (CH₂)_nAr, C₃-C₁₀ cycloalkyl, heterocyclyl, and heteroaryl, or R⁴ and R⁵ together with the nitrogen to which they are attached optionally form a ring having 3 to 7 carbon atoms and said ring optionally

contains 1, 2, or 3 heteroatoms selected from the group consisting of nitrogen, substituted nitrogen, oxygen, and sulfur;

when R^4 and R^5 together with the nitrogen to which they are attached form a ring, the said ring is optionally substituted by 1 to 3 groups selected from OH, OR^4 , NR^4R^5 , $(CH_2)_mOR^4$, $(CH_2)_mNR^4R^5$, $T-(CH_2)_mQR^4$,

$CO-T-(CH_2)_mQR^4$, $NH(CO)T(CH_2)_mQR^4$, $T-(CH_2)_mCO_2R^4$, or $T(CH_2)_mCONR^4R^5$;

R^6 is alkyl;

R^8 and R^9 independently are H, NR^4R^5 , $N^+(O)R^4R^5$, $N^+R^4R^5R^6Y^-$, COR^4 , CO_2R^4 , $CONR^4R^5$, $SO_2NR^4R^5$, SO_3R^4 , PO_3R^4 , CN or nitro;

when the dotted line is absent, R^9 can additionally be = NOH,

= NOalkyl, = NOalkenyl, = NOalkynyl or = NOcycloalkyl;

and

Y is a halo counter-ion;

with the proviso that: (a) when R^8 and R^9 are both hydrogen, W is NH, R^1 is hydrogen and X is NR^{10} , then R^{10} is neither unsubstituted (C_1-C_{10}) alkyl, unsubstituted (C_1-C_{10}) alkenyl nor unsubstituted (C_1-C_{10}) alkynyl; and

(b) when R^8 or R^9 is NR^4R^5 , $N^+(O)R^4R^5$, $N^+R^4R^5R^6Y^-$, COR^4 , CO_2R^4 , $CONR^4R^5$, $SO_2NR^4R^5$, SO_3R^4 or PO_3R^4 , then one or more of R^4 , R^5 and R^6 must be, independent of the nitrogen to which said one or more of R^4 , R^5 and R^6 is attached, $(CH_2)_n$ aryl wherein n is zero, 1, 2, or 3, heterocyclic or heteroaryl;

(c) when X is S and W is NH, then at least one of R^1 , R^2 , R^3 , R^8 and R^9 is other than H or C_1-C_3 alkyl;

in combination with a pharmaceutically acceptable carrier, diluent, or excipient.

59. A pharmaceutical formulation comprising a compound of Claim 56 in combination with a pharmaceutically acceptable carrier, diluent or excipient. - -